By Carl Malamud

X.400, Making Sure the Message Gets Across

Some say that when X.400 stabilizes, all our messaging problems will vanish. And X.400 and its X.500 kin are certainly being touted as the ultimate approach to message exchange. So network managers now have to answer the big question: "How does X.400 fit into existing message-system architectures?"

Like the white knights that came before it (remember X.25, Ethernet, SNA, SAA, and Unix?), X.400 will fill a gap. But it's not going to be the final answer to anything. Instead, it'll be an important tool in an arsenal consisting of many software systems.

One way to better understand the role of X.400 is by comparing it with other backbone technologies like Fiber Distributed Data Interface. FDDI is an extremely fast (100 Mbit/s) data link layer protocol that's particularly suitable for backbones interconnecting smaller networks—multiple Ethernets and token rings, for instance—on a large site. But FDDI will by no means replace Ethernet, token ring, ARCnet, and other local or specialized LAN protocols. X.400, like FDDI, is first and foremost an interconnection protocol, a great leveler of proprietary and de facto approaches.

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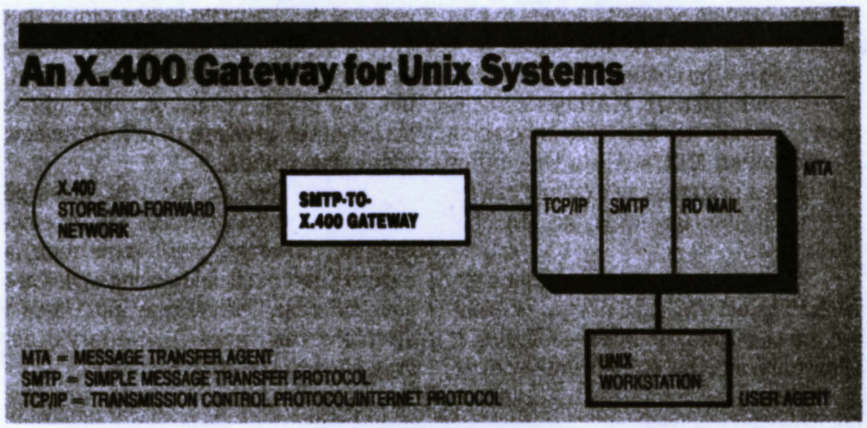
X.400 can be divided into two pieces. The message-transfer part of the standard specifies how two computers can exchange a message—some arbitrary block of data (usually text) with an "envelope" that signifies who should receive it. Programs that implement these message formats are Message Transfer Agents (MTAs), which may have to forward a message to yet another MTA for delivery.



The second part of the standard, the messaging component itself, identifies standard services that an X.400-based system provides. These are manifested as fields in the header or envelope and indicate handling and details such as the address to use for replies, date of the message, or a request for a receipt upon delivery. The interpersonal messaging component also identifies the type of data in the message—plain text, say, or a color image.

Actually, there's a third piece to a message-handling system, the user interface, an application that's used to compose and read messages. The MTA gets the message to the destination, and the messaging component defines what a message looks like. The user program, called a user agent, accesses these services through a messaging application program interface and presents the user with a menu of options, directory of mail user names, and other utilities.

X.400 is very careful not to specify what a user interface looks like. It only handles delivery of the messages and their format while en route. Many different programs—word processors, mail programs, databases—will want to use this service, hence the need for many different user interfaces.

So how does Action Technologies Inc.'s Message Handling Service (MHS), IBM's SNA Distribution Services (SNADS), or Digital Equipment Corp.'s Message Router and Mailbus relate to X.400? Superficially, all of these systems address the same issues as the X.400 standards. They allow a program to submit a message with a standard format that will be transferred to the destination user.

It's important to realize that all three proprietary message-handling standards address issues specific to the environments they serve. Action Technologies' MHS, for instance, has specific support for DOS file formats. More important, Novell bundles it in with its network operating system—meaning that the MTA is included in the price of the network.

SNADS handles the issue of routing messages in the fairly complex SNA environment, using a large IBM mainframe as both an MTA and the user interface. SNADS is actually the MTA for a program called DISOSS (Distributed Office Support System). DISOSS is the user interface for a library system (including messaging) on the MVS operating system.

PROFS is the other large messaging

system sold by IBM. Running under the VM/CMS operating system, PROFS uses a network-based job-entry facility in SNA called NJE rather than SNADS. PROFS and DISOSS users can communicate with each other using a PROFS bridge built into DISOSS. Thus, two technically different message-handling systems appear to the user as though they were integrated.

DEC's Message Router takes advantage of the architectural features of DECnet that provide seamless access to files across a DEC network. MAILbus protocols establish the connections to the Message Router software. MAILbus is a common interface to the DEC messaging environment. DEC's All-in-One office automation system is an example of a native application that uses the MAILbus interface.

Message Router has other user interfaces. The old VMS mail utility, for example, has a gateway to Message Router. It allows users in the VMS Mail utility to exchange messages with All-in-One users.

All three environments also have gateways to others. For example, SoftSwitch makes gateways that will allow DEC, MHS, and SNADS to connect to one another and to X.400. The gateways operate much the same as DEC Message Router gateways, translating the address and document content to conform to the standards of the receiving environment.

The gateway's job is to receive a message and translate it into a form that the next message-handling service can understand. In an all-DEC environment, this is a simple matter of changing the header of the envelope to reflect the new addressing method.

In the case of the DEC Message Router gateway to the IBM SNADS environment, however, more translation is needed. First of all, addressing styles are quite different. The gateway must keep a directory that maps DECnet-style addresses to SNADS-style addresses.

Second, the gateway has to take the message and actually modify the format of the contents. In the DEC environment, messages use the ASCII character set; in SNADS, the EBCDIC character set is used.

The job of converting every message format to every other message format is enormous. What X.400 does is to provide a common gateway method. A single type of gateway can replace the patch lines required for the mix-and-match system combinations in an organization. If every message-system vendor builds a gateway to X.400 (see the figure for an example of a Unix X.400 gateway), then the job of connecting multiple, dissimilar message systems is infinitely simplified. ■

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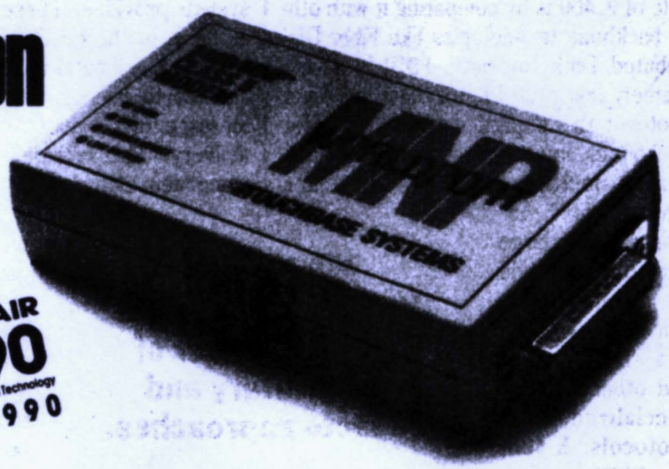

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